CLAIMS

In the claims:

1. A multicolor particle analyzer including:

a capillary;

means for projecting a light beam through said capillary to illuminate a predetermined volume in said capillary;

means for causing a sample containing sample particles which naturally fluoresce or are tagged to fluoresce and emit light at one or more distinct wavelengths to flow along the capillary through said predetermined volume;

a tunable filter for receiving said light emitted by each particle and repetitively pass light pulses for each wavelength of light emitted by each particle as it passes through said predetermined volume; and

a detector for detecting the output light from said acoustic-optic filter and provide an output pulse for each light pulse at each of said multiple wavelengths.

2. A multicolor particle analyzer as in claim 1 in which the tunable filter is an acousto-optic filter.

3. A multicolor particle analyzer as in claims 1 or 2 including a detector for detecting light scattered by said particles as they travel through the predetermined volume.

4. A multicolor particle analyzer for analyzing particles each of which emits light at multiple distinct wavelengths as they pass through an analyzing volume comprising:

a tunable filter for receiving the emitted light and repetitively pass light at said distinct wavelength as said particles pass through the analyzing volume; and

a single detector for receiving the light from the tunable filter and provide output signals for each distinct wavelength as the particle passes through the analyzing volume.

5. The method of analyzing particles each of which fluoresces and emit light at multiple different distinct wavelengths responsive to excitation light which comprises the steps of:

causing the particles to flow through an analyzing region;

applying excitation light to the analyzing region to cause each particle to emit light at its distinctive wavelengths as it passes through the analyzing region;

receiving the emitted light with a tunable optical filter to repetitively and sequentially pass light at each of said multiple distinct wavelengths; and

detecting the light passed by the filter with a single detector to provide output signals representative of the distinct wavelengths.

6. The method of claim 5 wherein the particles are caused to flow at a rate such that the light emitted by a particle is passed by the tunable filter a number of times as the particle transits through the analyzing region.

7. A particle analyzer for analyzing particles in a sample fluid which fluoresce and emit light at one or more wavelengths comprising:

a capillary for receiving the sample fluid;

a pump for causing the sample fluid to flow through the capillary;

a light source for projecting a light beam through the capillary to illuminate a predetermined region along the capillary whereby singulated particles flow through the illuminated region and emit fluorescent light at the one or more wavelengths;

a tunable optical filter responsive to tuning pulses for receiving the florescent light and repetitively passing pulses of light at said one or more wavelengths as a particle passes through said region;

a detector for receiving said light pulses and provide an output signal for each of said pulses, and;

a processor configured to receive said out signals and provide an output signal representative of the amplitude of each of said one or more fluorescent wavelengths.

8. A particle analyzer as in claim 7 in which the tunable filter is an acoustic-optic filter.

9. The method of analyzing particles in a fluid which fluoresce at one or more wavelengths comprising the steps of:

causing the fluid to flow past a source of illumination whereby particles emit fluorescent light at the one or more wavelengths

periodically detecting the emitted characteristic fluorescence of said particles as the flow through the illumination source; and

providing output signals representative of the characteristic wavelength of each of said particles.

10. A method as in claim 9 in which the characteristic fluorescence is detected by periodically passing the emitted light at each characteristic wavelengths through a filter and detecting the passed emitted light.